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Instruction manual

Condensation dryer
DH 10 / DH 20

AERIAL GmbH - Oststraße 128 - 22844 Norderstedt - Germany
Tel.: 0049 40 / 52 68 79 0 - Fax 0049 40 / 52 68 79 20 - e-mail: info@aerial.de

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1 General advice

You have bought an air dryer from AERIAL thus deciding for a proven quality product. If nevertheless complications should occur, you will find some advice hereinafter how to eliminate such difficulties as quickly as possible.

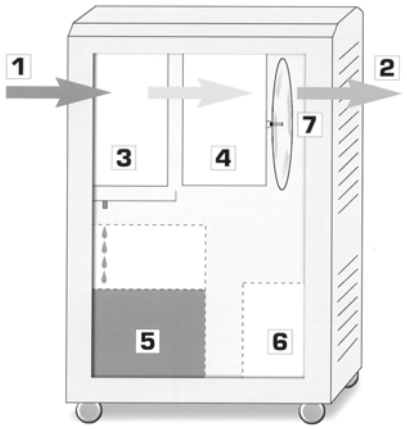
Attention!

- *Immediately after receipt, you should check your air dryer for transport damage! In the case of damage, you should inform the forwarding agent, parcel service, post office etc. accordingly upon receipt, and make a note of it on the forwarding documents!*
- *If a transport damage should be stated after unpacking the equipment, please contact immediately your respective seller.*
- *Before putting your air dryer into operation for the very first time, these instructions for operation should be studied very thoroughly. Thus, you can make sure that this appliance will operate perfectly for a long period of time saving yourselves unnecessary repairs and expenses.*
- *In the case of technical unclarity or faults disconnect your appliance and ensure that it is not connected again by taking the mains plug out of the socket.*
- ***Please, keep the device wrapping in order to be able to send the device safe for guarantee repair. In order to save place you open simply the adhesive tape with a knife and you fold the carton.***

2 Design of equipment and mode of functioning

The DH-air dryer is constructed exclusively for air drying in closed rooms. That dehumidifier can prevent the formation of sweating water, eliminate too high air humidity and hold a specific air humidity unchangeable. The time which the dryer requires in order to achieve a specific humidity depends essentially on the environmental conditions. The attainable humidity value is equally dependent on the environmental conditions.

The DH-dehumidifier works according to the condensation principle with heat recovery. The fan (partial positions see detail drawing) suck the moist air through a cool register (evaporator). The air becomes so far chilled under the point of condensation here, that the steam of air condense as water and flows into the water-collecting tank. The chilled and dried air is warmed up at the condenser again. Through the heat pump effect, the outlet air is some degrees warmer than the sucked room air. Vigour profit can conducted up to 3-fold of the electrical power consumption. The absolute moisture of air is lowered continuously by the continuous circulation of the room air through the device. The surplus moisture is removed takingly and efficiently.



1 - wet room air
2 - dry air
3 - evaporator (cooling)
4 - condenser (warm up)
5 - condensate (in tank)
6 - compressor
7 - fan

3 Safety

The condensation dryers AD 520 and AD 620 are furnished with protective devices. The devices were subjected to a safety examination. Dangers threaten in the case of operating error or abuse

- for the user.
- for the machine and other real values.
- for the efficient work of the machine.

All persons who have to do with the list, initiation, service and maintenance of the devices must be qualified correspondingly and consider this operating manual precisely.

Using as directed
The condensation dryers are intended for the drying of air with atmospheric pressure.

Risk by accessory
Hoses for condensate removal and air filters must be fit expertly and must not take the protective devices of the condensation dryers out of operation. The control elements must always remain freely amenable.

Authorized users
The service of the condensation dryers AD 520 and AD 620 may only be carried out by persons, that were instructed from the operator . The user is responsible in the field of action third parties compared to.
Responsibilities for different activities on the device must of course be determined and kept. Unclear competences are a safety hazard.
The operator must make the operating instruction amenable for the user and make sure that the user did understand the manual.

4 Installation and transport

The DH-dehumidifier is planned for the mobile effort and wall mounting on a wall bracket (optionally available). During the setting up and transportation of the dehumidifier, the following items are to be considered:

- That dehumidifier must be installed so that the air can circulate without obstruction through him. The air filter and also the lamellae of the front wall must not be covered. The open space before the lamellae and the air filter must at least conduct 1 meter.
- Before every local alternation of the device, switch off the device at the on/off-switch, pull the power plug from the socket and empty the water tank!
- The air dryer must be moved only using the provided roll resp. handle systems!
- The air dryer must be installed on a plane base only, as otherwise it must be secured against rolling off!
- That dehumidifier can be transported standing or lying! The standing transportation is to be preferred if possible.
- The appliance must be used exclusively for air drying.
- When using a bracket for wall mounting, this must be levelled by means of a water balance!

Attention!
Do never pull or move the device at the power cable!

5 Electrical connection

Before connecting the air dryer, the following items must be checked:

- ✓ Does the mains voltage coincide with the voltage of the appliance?
- ✓ Adequate fusing of socket and supply system?
- ✓ Has the required residual-current-operated circuitbreaker (r.c.c.b) been installed in case of swimming baths?
- ✓ If a cable drum is used: has it been unwound completely?
- ✓ Is the appliance connector suitable for the building socket?
- ✓ Is the socket provided with a perfect grounding?

> ***Attention!***
> *Before putting the air dryer into operation, the technical data of the appliance should be compared to the conditions prevailing in the room of installation!*

6 Operation

6.1 Putting into operation

> ***Attention!***
> *Before putting the air dryer into operation, the instruction manual should be studied carefully. Thus, damages by a false or inappropriate operation as well as by inadequate environmental conditions can be avoided.*

For using the air dryer, please proceed as follows:

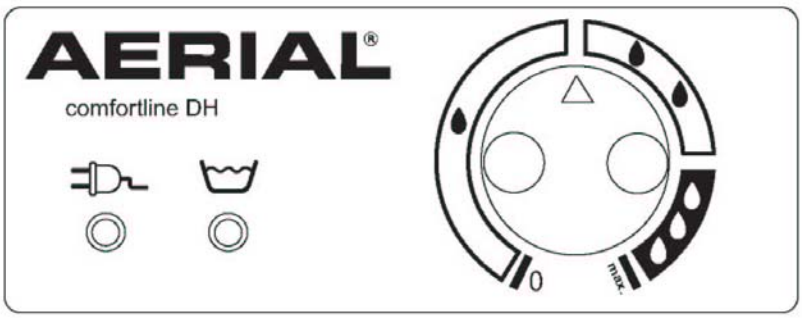
- ✓ After having been transported, the air dryer should rest for abt. 15 min. During this period of time, the oil distributed inside the refrigerating system and frothed during transport will return into the compressor. We recommend this procedure since it extends the service life of the compressor.
- ✓ Put the plug into the socket.
- ✓ Check whether the bucket is inside the equipment resp. whether the drain hose has been fastened and laid appropriately.
- ✓ Switch on the appliance at the hygrostat.
- ✓ Set the required humidity value at the hygrostat (please refer in this respect to 'Hygrostat Control').
- ✓ If the existing humidity is higher than the set value, the air dryer will start to operate.
- ✓ If the existing humidity is lower than the set value, the air dryer will not start to operate.

6.2 Hygrostatregelung

The air dryers of the DH-series dispose of a hygrostat for setting the required humidity value. The hygrostat is placed at the upper side of the unit. It makes that the air dryer cuts in as soon as the ambient humidity exceeds the preset value. If the humidity value falls below the set value, the hygrostat will switch off the appliance.
The following operating modes can be set by means of the hygrostat:

- ➢ The marker of the knob points at position **"O"** the device is **switched off**. It is not drying.
- ➢ The marker of the knob points at the **field with one drop**: The device is working. When achieving a humidity of approx. 70% r.h. (relative humidity) the unit will switch off.
- ➢ The marker of the knob is between the **field with one drop and the field with two drops**: The device is working. When achieving a humidity of approx. 50% r.h. (relative humidity) the unit switch off .
- ➢ The marker of the knob shows onto the **field with three drops**: The device is working. When achieving a humidity of approx. eliminate 40% r.h (relative humidity) the unit will switch off.

- The marker of the knob points at position **"max":** the device is in continuous operation



> ***Attention!***
> *The marks at the rebound curve and the humidity values mentioned above are to be seen as reference values only. The hygrostat of the air dryer and a hygrometer located inside the room to be dried most probably will not indicate the same values. It is recommended to change the setting at the air dryer until the desired room humidity has been reached.*

6.3 Condensate outlet

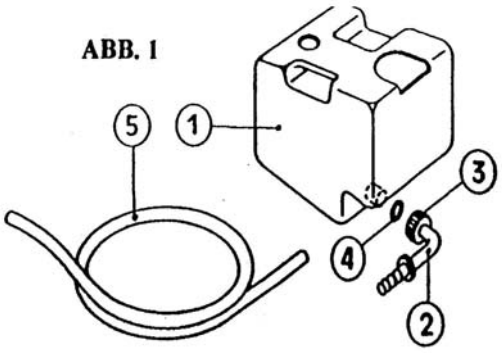
The air dryers of the DH-series are serially equipped with water collecting tanks and with fittings for 12 mm hoses. If the water collecting tank is used, the appliance will switch off automatically when the tank is full, and the red pilot lamp will light up.

> ***Attention!***
> *The device switches itself off automatically during withdrawal of the water tank. It will only starts working again if the bucket adjusted be properly (swimmer on the bucket must osculate the microswitch in the device). If the device will not start immediately, the bucket should be moved a little in the device.*

If a hose is used for the draining the condensate, it should be proceeded as follows:

- ✓ Remove the bucket from the bucket compartment.
- ✓ At the bucket you find a connecting piece . Bore a hole into that connecting piece. **Avoid injuries!**
- ✓ Screw the connecting angle on that connecting piece of the bucket. Don´t forget the sealing.
- ✓ In the door of the dryer is a pressed sector. Open this sector to put the hose through after putting back the bucket into the dryer.
- ✓ The bottom of the hose must go downwards to leave the unit.

1 - bucket
2 - connecting angle
3 - fastening
4 - sealing ring
5 - pipe
without drawing: sealing
It is the seal for the case that you would like no more to use the tubing. In this way, you can lock the aperture in the bucket again when you place the seal under the fastening and turn firmly this again onto the threaded connecting piece.



Attention!
- *The end of the hose must be situated lower than the beginning of the hose (runoff socket)!*
- *The hose must never be bent!*
- *No objects must be placed onto the hose!*

6.4 Automatic defrosting

During air drying, ice may form at the evaporator. The volume of ice depends on the ambient conditions prevailing in the room to be dried. The air dryer is equipped with an automatic air-defroster. It ensures that, depending on the extent of ice formation, the appliance will be defrosted automatically according to the following principle:
- A temperature sensor measures the condition existing in a critical area of the evaporator.
- It transmits the signal for defrosting.
- The compressor switches off and the fan runs further.
- The ice is thawed with ambient air.
- Subsequently, the air drier will operate again in the normal air-drying mode.

➢ Operating conditions

Air driers of the DH-series are suitable for application on closed and heated rooms. DH-air dryers can be operated within a temperature range from +5 to 32°C and with a relative humidity of 40 to 100 %. An optimal working is achieved at temperatures from 15 °C and more.

Attention!
The appliance must not be used under the following conditions:
- *in rooms of potentially explosive atmosphere*
- *in rooms of aggressive atmospheres, for example ammonia and wood acid*
- *In rooms with water which shows a pH-value outside of 7,0 to 7,4.* ***Remark****: In the case of lower pH-value, corrosion occurs at all metals and damages occurs at mortar containing materials. In the case of higher pH-value, it comes to irritation of skin and eye mucous membrane and extreme lime deposits.*
- *in rooms featuring a high concentration of solvents*
- *in rooms of an extremely high ratio of dust´.*

In the case of doubtful operating conditions it is recommended to contact the Technical Department of Messrs. AERIAL or a specialized dealer.

Using an AD-air dryer under inadequate operating conditions will entail that the warranty becomes null and void!

7 Technische Daten

	DH 10		
Range of application	+5 to +32°C, 40 to 95 %r.h.		
Supply voltage, frequency	230V, 50Hz		
Safety class 1 acc. to VDE 0106 T1			
Degree of protection IP23 acc. to DIN 40050			
air flow	160 m³/h		
Noise level	42 dB(A)		
dimensions (width/height/depth)	400 mm / 550 mm / 400 mm		
weight	24 kg		
refrigerant	275 g R134a		
Warranty	24 months from date of purchase		
Fusing	6A		
Protection in swimming baths	r.c.c.b.		
Performance data acc. to DIN EN 810 E			
Temperature/rel. humidity	Drying capacity **l/day**	Power consumption **Watt**	Drying coefficient in l/kWh
30°C / 80%r.F.	10,0	275	1,53
27°C / 60%r.F.	5,5	230	1,0
20°C / 60%r.F.	3,0	192	0,65
	DH 20		
Range of application	+5 to 32°C, 40 to 100%r.h.		
Supply voltage, frequency	230V, 50Hz		
Safety class 1 acc. to VDE 0106 T1			
Degree of protection IP23 acc. to DIN 40050			
air flow	170 m³/h		
Noise level	42 dB(A)		
dimensions (width/height/depth)	400 mm / 550 mm / 400 mm		
weight	26 kg		
refrigerant	325 g R134a		
Warranty	24 months from date of purchase		
Fusing	6A		
Protection in swimming baths	r.c.c.b.		
Performance data acc. to DIN EN 810 E			
Temperature/rel. humidity	Drying capacity **l/day**	Power consumption **Watt**	Drying coefficient in l/kWh
30°C / 80%r.F.	20,0	549	1,52
27°C / 60%r.F.	11,0	456	1,0
20°C / 60%r.F.	6,0	385	0,65

Among other things, many different components which are installed in the condensation dryer decide on the capacity of the device. Since these components can never be completely identical, in accordance to DIN EN 810 the capacity may deviate up to 5% of specified capacity.

8 Trouble shooting

trouble	Pos.	Cause	Relief
The dehumidifier shows a bad and/or no drying capacity.	1	The humidity in that room is lower than 40% r.h. .	The effort of the dryer is uneconomical in the case of these conditions. It is recommended to disconnect the dryer. **Tipp**: Put the built-in hygrostat on an attainable value (e.g. approx. 50%r.F.), with it the dryer punctually may switch off.
	2	The air filter is soiled	The dryer does not receive air sufficiently. Clean the filter and/or install a new one. A soiled air filter can in the long run lead to disadvantages at the dryer. **Tipp**: Control the filter regularly.
	3	The temperature in that room is lower than +15°C.	In the case of these conditions, the capacity of DH-types is very small on account of the design of the refrigeration components and the automatic defrosting. We only recommend DH series for heated rooms with temperatures >= 15°C.
	4	A mistake in the cooling circuit of the dryer is possible.	The defect must be eliminated by an expert.
The automatic circuit breaker of the building disturbs the voltage supply to the device.	5	The safeguard of the building is too weak.	The building safeguard must be checked and/or transposed.
	6	A malfunction in the electrical circuit of the dryer is available.	The voltage supply of the dryer must be disturbed. (Pull power plug!) The defect must be eliminated by an expert.
The compressor of the dryer is out of operation. The fan is still running.	7	The dryer is in the defrost mode	The compressor starts again after some time. The time depends on the room temperature. If it does not start again, the defect must be eliminated by an expert.
It occurs an unusual, strong noise formation	8	One or several case screws are not tightened correctly.	The slack case screws must be tightened correctly.
The complete dryer is out of operation	9	The dryer is switched off	Switch on the unit at the hygrostat
	10	The humidity adjusted at the hygrostat is achieved.	The dryer turns on automatically after exceeding the adjusted humidity again.

	11	The water tank is full or is not placed correct in the device	The red lamp does light up simultaneously. The water-collecting tank must be emptied and must be inserted correctly again. The bucket must be put into the device with the swimmer ahead. (Opinion from the back: The smooth, closed bucket side is visible) the swimmer must osculate the microswitch in the device. Move the receptacle in the device slightly back and forth where appropriate. They will find the correct position as soon as the device starts.
	12	There is defective at the device	The defect must be eliminated by an expert.
That dehumidifier is frozen at the evaporator very strong. You can see an ice block.	13	Die Raumtemperatur war / ist zeitweise oder ständig unter +5°C.	You might put the dryer into a room with at least +15°C and wait until the entire has thawed ice. Turn on after this the device again (in that room with 15°C) and it might let about 3 hours run. If a new glacial block should form itself, contact your supplier. Otherwise make sure that the device is only used in rooms, in which +15°C being at least. Ice build-up is also possible after too immediate switch-on after storage in colder conditions.
	14	There is a defective at the automatic defrost system	The defect must be eliminated by an expert.

The dryer does not achieve the humidity adjusted at the hygrostat and/or does not switch itself off via the hygrostat.	15	The hygrostat is adjusted onto a value below 45% r.h..	A condensation dryer can achieve - depending on environmental conditions - at a minimum a value from 40 to 45% r.h. . Put the built-in hygrostat on an attainable value (e.g. approx. 50%r.h.), with it that dehumidifier punctual may switch off.
	16	The unit is to small for your application	The air changing rates, persons in that room and open water surfaces decide on the humidity load. Ask your authorized dealer to calculate if the unit has enough capacity for your application.
	17	Im Raum, in dem das Gerät im Einsatz ist, herrschen Temperaturen unter 15°C	Da die Entfeuchtungsleistung der DH-Serie bei kühlen Bedingungen aufgrund der Auslegung der Kältekomponenten und aufgrund der Luftabtauung nicht optimal ist, empfehlen wir den Einsatz dieser Geräte nur in beheizten Räumen mit Temperaturen >= +15°C.
	18	There is a lot of moist in the walls and in the floor (Building materials) .	In this case, the dryer needs some time to remove all that water and to achieve an acceptable humidity in that room
	19	A mistake at the hygrostat is possible.	Check the hygrostaten: Does the unit siwtch off when you dial the knob to „O“ ? If it does not switch off, there is a mistake. Contact your supplier.
	20	A mistake in the cooling circuit of the dryer is possible..	Check whether water gathers in the water tank. If this is not the case although the compressor ran permanently, you should get in touch with your supplier.

Attention!

The appliance must be repaired by a trained and expert personnel only. In the case of interventions by unauthorized people, any and all warranty claims shall become null and void! If you have any questions regarding defects and malfunctions of AERIAL-air dryers we recommend to get in touch with your supplier.

9 Repair and maintenance

> ***Attention!***
> *When performing any repair or maintenance, the general safety rules and provisions must be adhered to!*

In normal operation, the air filter should be cleaned regularly. It recommends to exchange the air filter 2x in the year.

Further maintenance operations at the dehumidifier are not necessary.

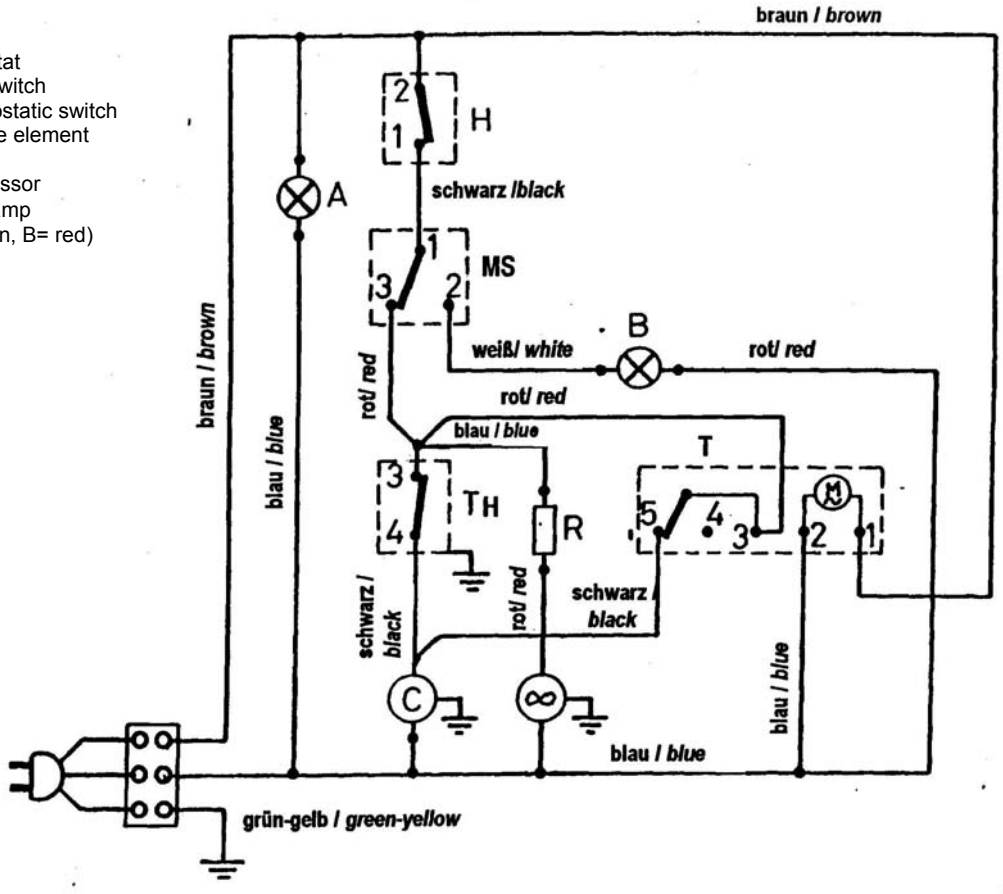
In order to safeguard a perfect operation of the air dryer, the appliance should be cleaned at regular intervals. It is recommended to proceed as follows:

- ✓ Switch OFF the air dryer
- ✓ Disconnect mains cable
- ✓ Remove filter for cleaning or disposal
- ✓ Dismount cover and front panel
- ✓ Expose appliance to compressed air for cleaning (wear protective goggles!)
- ✓ Visual inspection of the outlet socket
- ✓ Clean the appliance using a moist cloth (do not use any aggressive detergents!)
- ✓ Mount front panel and cover
- ✓ Insert new resp. cleaned filter
- ✓ Connect mains cable
- ✓ Switch ON the air dryer.

No other maintenance work is required for the air dryer.

10 Circuit diagram

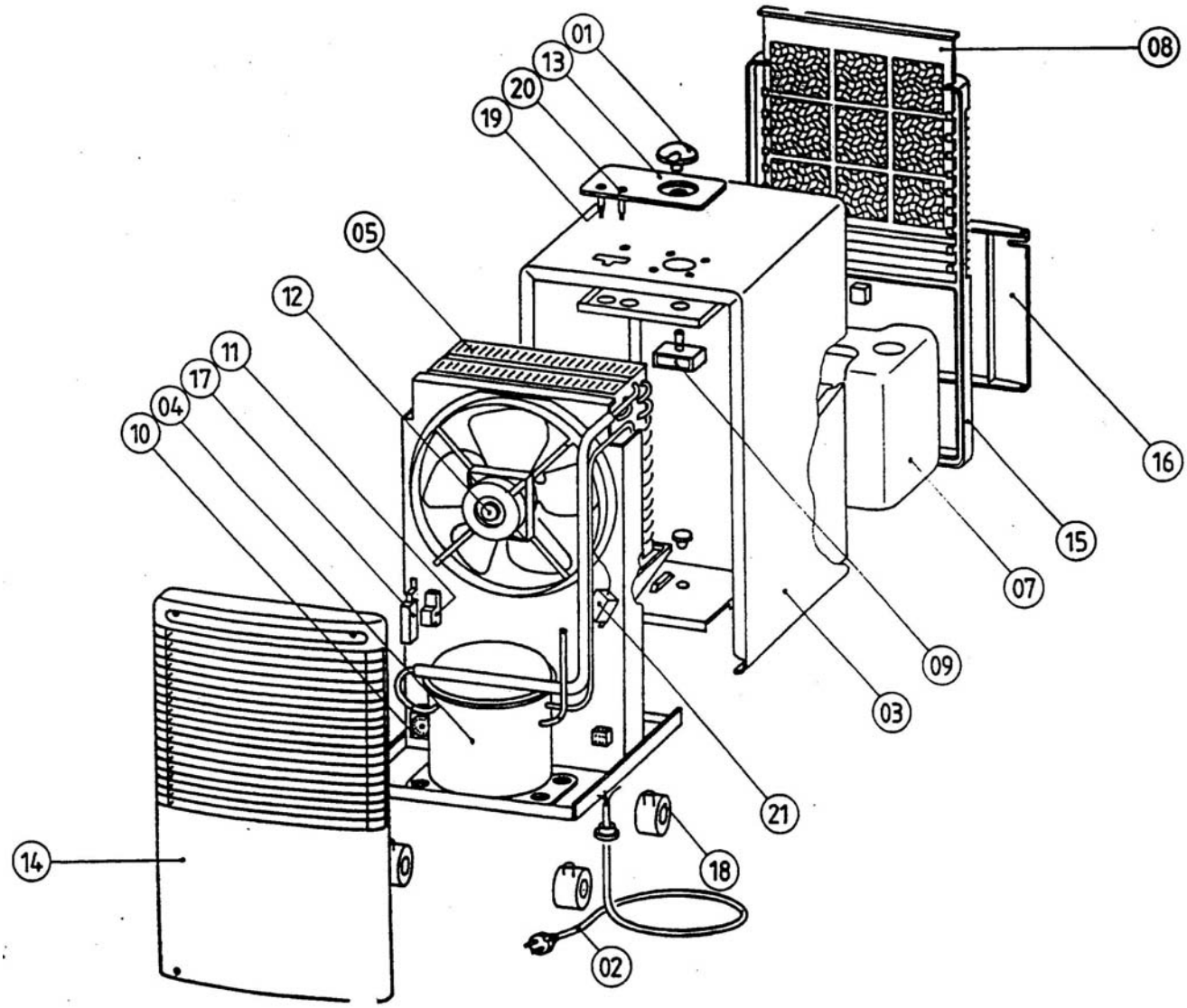
H	= Hygrostat
MS	= micro switch
TH	= Thermostatic switch
R	= resistive element
T	= Timer
C	= compressor
⊗	=signal lamp (A= green, B= red)
⋈	= fan



11 Bezeich Denotation of the most important components DH

Pos.	Denotation	Pos.	Denotation
1	Hygrostat knob	12	fan
2	Main cable with plug (ca. 2,5 mtr.)	13	Operating panel (plastic)
3	cover	14	front
4	compressor	15	Reverse seide (without door)
5	condenser / evaporator-unit	16	door
7	Water tank with swimmer	17	Resistive element
8	Air filter	18	Double-wheel (4 pcs.)
9	Hygrostat	19	Signal lamp green: ready for operating
10	Timer	20	Signal lamp red: tank full
11	Micro switch	21	thermostatic switch for defrosting

12 Drawing of the main components DH



13 Manufacturer declaration

(EG-directive 89/392/EWG)
(EG-directive 89/336/EWG)
(EG-directive 73/ 23/EWG)

supplier: AERIAL GmbH - Systeme zur Luftbehandlung
Oststraße 128, D-22844 Norderstedt

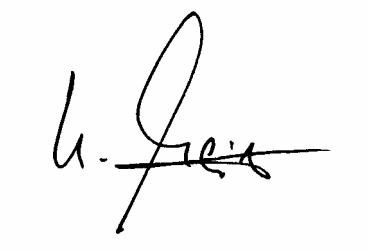
Product description: Luftentfeuchter DH 10 / DH 20

Rated capacity: 10 l/24h / 20 l/24h

The product described above is an ambient air dryer ready for connection.

Related standards:		
	EN 292	Safety of Machinery
	EN 50081-1	Electromagnetic Compatibility (EMC) Basic Specification "Emitted Interference"
	EN 50082-1	Electromagnetic Compatibility (EMC) Basic Specification "Emitted Interference"
	EN 60335-2-40	Safety of electric appliances for domestic use and similar purposes

Norderstedt, 01.07.2003 signature / stamp



14 Purchase data (please fill out)

Date of purchase: _____

Serial-no.: _____
(you find it on the type plate at the rear side of the unit where the bucket is in)

Dealer: (stamp of your supplier